

HEPATITIS A

Also known as: Infectious hepatitis, Epidemic hepatitis, Epidemic jaundice, Catarrhal jaundice, Type A hepatitis, HA, HAV

Responsibilities:

Hospital: Report by IDSS, facsimile, or phone

Lab: Report by IDSS, facsimile, or phone

Physician: Report by facsimile, or phone

Local Public Health Agency (LPHA): Follow-up required

Iowa Department of Public Health

Disease Reporting Hotline: (800) 362-2736

Secure Fax: (515) 281-5698

1) THE DISEASE AND ITS EPIDEMIOLOGY

A. Agent

Hepatitis A is an infection primarily affecting the liver caused by the hepatitis A virus (HAV), a nonenveloped RNA virus that is classified as a picornavirus.

B. Clinical Description

Initial symptoms: - Over 70% of infections in children <6 years of age are asymptomatic. The proportion of symptomatic infections increases with age. The onset of hepatitis A in adults is usually abrupt. Initial symptoms may include low grade fever (usually < 39.5° C), myalgia, mild headache, malaise, anorexia, nausea and abdominal discomfort; some individuals may experience diarrhea.

Subsequent symptoms: One to seven days after initial symptoms jaundice (yellowing of the skin and sclera), dark urine and clay-colored stool may occur. Among older children and adults, infection is typically symptomatic, with jaundice occurring in > 70 % of patients. The duration of a typical course of hepatitis A is 2 – 6 weeks.

Complications: may involve a prolonged, relapsing hepatitis, which can occur for up to one year. Relapsing hepatitis occurs in about 15% of cases. Hepatitis A is rarely fatal and has no chronic carrier state. The elderly and persons with chronic liver disease are at greater risk of fulminant (rapid and severe) hepatitis A. The greatest morbidity and mortality occurs in person greater than 50 years old. Hepatitis A is clinically indistinguishable from other types of hepatitis. It must be diagnosed through laboratory testing for hepatitis A IgM.

C. Reservoir

Humans with active infections (symptomatic or not) are the only natural reservoir for this disease. It is rarely found in chimpanzees or other primates.

D. Modes of Transmission

The primary modes of transmission are direct or indirect person-to-person spread via the fecal-oral route, including sexual contact, or ingestion of contaminated food or water. Transmission occurs most frequently among close contacts, especially in households and extended family settings. Virtually any food can be involved including ready-to-eat or uncooked food (sandwiches, salads, ice cream, strawberries, etc.), which can become contaminated by an infected food worker with poor hygiene; inadequate treatment of stool-contaminated drinking water (a rare source of hepatitis A in Iowa); contaminated produce (such as lettuce or strawberries irrigated or processed with contaminated water); or shellfish harvested from fecally contaminated waters and then consumed

raw or undercooked. The foods most commonly contaminated are raw, wet, and rough, such as lettuce and ice. Because the virus is present in blood during the illness prodrome, HAV has been transmitted on rare occasions by blood transfusion. Hepatitis A has been transmitted among drug users by fecally contaminating drug paraphernalia that is being shared.

E. Incubation Period

The incubation period for hepatitis A ranges from 15 -50 days, with an average of 28 – 30 days. The incubation period may be shorter with a greater hepatitis A virus (HAV) dose.

F. Period of Communicability or Infectious Period

Individuals are usually most infectious from 1 week before their symptoms begin to several days after onset of jaundice. Viral shedding in the stool is greatest during the week before symptom onset, until several days after onset. Virus excretion begins to decline at the onset of clinical illness, and has decreased significantly 7 – 10 days after onset of symptoms. If diarrhea exists, the patient's ability to transmit the virus is greatly enhanced. HAV infection provides lifelong immunity.

For public health intervention, a case is considered to be potentially infectious from 14 days before the onset of symptoms to 7 days after onset of symptoms. However, prolonged viral excretion (up to 6 months) has been documented in infants and children. Chronic shedding of HAV in feces does not occur.

G. Epidemiology

Hepatitis A has a worldwide distribution and occurs as sporadic cases and outbreaks. In countries where sanitation is poor, infection is common and occurs at an early age. Adults, therefore, are usually immune and outbreaks are uncommon. In developed countries, disease transmission is a problem in child care settings with diapered children, among household and sexual contacts of acute cases, among travelers to countries where the disease is common, and among the institutionalized. In some situations drug users can be at high risk.

2) DISEASE REPORTING AND CASE INVESTIGATION

A. Purpose of Surveillance and Reporting

- To identify whether the case may be a source of infection for other persons (*e.g.*, a diapered child, child care attendee, drug user or food handler) and if so, to prevent further transmission.
- To identify sources of public health concern (*e.g.*, a salad bar prepared by an infectious food handler) and to stop transmission from such a source.
- To quickly identify contacts so that post exposure prophylaxis with hepatitis A vaccine or Immune Globulin (IG) can be given as soon as possible and within 14 days of last exposure.

B. Laboratory and Healthcare Provider Reporting Requirements

Iowa Administrative Code 641-1.3(139) stipulates that the laboratory and the healthcare provider must report. The preferred reporting method is by immediate phone call. The reporting phone number for IDPH Center for Acute Disease Epidemiology (CADE) is (800) 362-2736; fax number (515) 281-5698:

Due to potentially serious public health implications, it is requested that acute or active (IgM +) cases of hepatitis A identified in food service workers, child care employees and attendees be reported by phone to CADE immediately (800) 362-2736, so post-exposure prophylaxis can be started as soon as possible for contacts at high risk of disease. These are considered public health emergencies.

Laboratory Testing Services Available

The University of Iowa State Hygienic Laboratory (SHL) tests single serum samples for Hepatitis A IgM antibody utilizing enzyme immunoassays. Accurate information about date of collection, dates of onset of symptoms, travel history, vaccination and disease history are essential for test

interpretation. For additional information on submitting samples or testing, contact the State Hygienic Laboratory at (319) 335-4500, or visit: www.shl.uiowa.edu/

C. Local Public Health Agency Follow-Up Responsibilities

Case Investigation

a. Confirm the diagnosis.

1) Was a hepatitis A IgM serology done?

Yes. Continue to step 2

No. Is the case epidemiologically linked to a confirmed case or a documented outbreak of hepatitis A?

An epidemiologically linked case is a case that meets the clinical case definition and occurs in a person who has an epidemiologic link with a person who has laboratory-confirmed hepatitis A (i.e., household or sexual contact with an infected person during the 15-50 days before the onset of symptoms).

Yes. Continue to b.

No. Assess if serology testing for hepatitis A IgM is indicated. If not indicated, no further investigation is necessary.

2) Is the individual's **anti-HAV IgM** positive?

Yes. Continue to step b.

No. No further case investigation is necessary.

b. Completing the Hepatitis A Case Investigation.

Utilizing the Iowa Disease Surveillance System (IDSS) is the preferred way to conduct the investigation. The local public health agency (LPHA) should complete the Hepatitis A investigation by contacting the healthcare provider and interviewing the case and others who may be able to provide the pertinent information. Much of the information required can be obtained from the case's healthcare provider, other involved medical providers, or the medical record. The case record will aid in determining the most probable source of the infection, whether the case is likely to transmit the infection to others, and whether contacts should be given hepatitis A vaccine or immune globulin (IG).

c. Determine if the case is associated with a common-source outbreak. If yes, contact CADE at (800) 362-2736.

- Does the case know of other persons with hepatitis A or with similar symptoms?
- Have any other cases investigated provided similar information (e.g., history of eating raw oysters from a particular food establishment, etc.)?
- If the case is child care-associated, refer to the managing special situations section for appropriate follow-up.

d. The main objective in following up a case of hepatitis A is to determine whether the case is likely to have transmitted the infection to others.

- Determine when the acute symptoms occurred and period of communicability of the case (two weeks before to one week after onset.)
- Determine whether the case is likely to have transmitted the infection to others. Likely transmission can occur in situations where a case is identified as a food handler, a patient care provider or is an employee or child at a child care setting during their infectious period.

e. Use the following guidelines to complete the case investigation form:

- 1) **Onset:** Because a case of hepatitis A is most infectious in two weeks before symptom onset until one week after, be sure to accurately record each symptom and its date of onset. If onset of symptoms is unclear, use the date when jaundice was first noticed as the date of onset.
- 2) **Occupation:** These questions (food handler, employment sections) are asked to determine the case's risk of transmitting the illness during the period of communicability (14 days before onset of symptoms to 7 days after) via food, including during patient care which can

involve feeding. Determine whether the case is a food handler or patient care provider. If so, appropriate control measures need to be instituted. **If the case is a foodservice worker, child care, or healthcare provider, call CADE immediately at (800) 362-2736.**

- 3) **Child care settings (and other similar settings):** These questions are asked because hepatitis A is spread through the fecal-oral route. Children with hepatitis A are often asymptomatic; however, they may still be shedding the virus in their stool. Persons who are exposed to the fecal material of these cases could be exposed to hepatitis A. Determine whether the case is a child, resident or employee in a supervised care facility. If so, appropriate control measures need to be instituted. See child care assessment tool in the Epi Manual's Hepatitis A section.
- 4) **Risk factors/travel:** Using the incubation period for hepatitis A (2 to 6 weeks), ask the case about food consumption, supervised care settings, and other exposures during the incubation period before the illness started.
 - a. **Contact with known cases:** These questions are asked because hepatitis A can be spread through household or sexual contact.
 - b. **Vaccination history for hepatitis A.** Document previous doses of hepatitis A vaccine, if any.
 - c. **Travel history:** These questions are asked in order to identify where the patient may have become infected. Because of poor sanitation and overcrowding, hepatitis A is endemic in many developing countries. A recent history of foreign travel may be indicative of foreign exposure.
 - d. **Food consumption:** Questions about raw shellfish consumption should be asked because occasionally hepatitis A virus infection has been associated with ingestion of uncooked or partially cooked shellfish grown in sewage-contaminated waters. Ask about other high-risk foods such as salads, ice and sandwiches with lettuce and tomato. If it is suspected that the case became infected through the consumption of shellfish or other food(s), the LPHA should notify CADE, which can work in coordination with the Department of Inspection and Appeals Food and Consumer Safety Division to determine if additional control measures are warranted.
 - e. **Contacts:** Complete contact information documenting type of contact, symptoms (if present) and whether post exposure prophylaxis (PEP) was given, as well as the type of PEP given.

4). **Every effort should be made to complete the investigation because of the potential for outbreak with this disease.** If several attempts have been made to obtain case information, but have been unsuccessful (*e.g.*, the case or healthcare provider does not return calls or respond to a letter, or the case refuses to divulge information or is too ill to be interviewed), complete the IDSS case investigation form with as much information as can be gathered and notify CADE, which may be able to assist in the investigation.

After completing the case investigation, enter information into IDSS or fax along with lab reports to CADE at (515) 281-5698.

3) CONTROLLING FURTHER SPREAD

A. Isolation and Quarantine Requirements

Minimum Period of Isolation of Patient

All hospitalized patients are on Standard Precautions.

Diapered or incontinent patients should be placed on Contact Precautions:

Infants and children <3 years of age for duration of hospitalization

Children 3-14 years of age for 2 weeks after onset of symptoms

>14 years of age for 1 week after onset of symptoms

At home, counsel the patient to modify activities in order to prevent transmission until the end of the infectious period or one week after onset of symptoms. The patient should not prepare food for others, and practice good handwashing after toileting. Persons assisting a patient with toileting should practice good hand washing and wash the patient's hands after toileting.

Persons who are child care or healthcare providers and food handlers should not work until 7 days after onset of jaundice or two weeks after the onset of symptoms.

Minimum Period of Quarantine of Contacts

None

B. Protection of Contacts of a Case

Persons who have documentation of previous hepatitis A disease or of receiving hepatitis A vaccine at least one month before an HAV exposure do not need post-exposure prophylaxis. For public health intervention, a case is considered to be potentially infectious from 14 days before the onset of symptoms to 7 days after onset of symptoms. Fecal shedding of the virus peaks during the 2 weeks before onset of symptoms until several days after onset. If diarrhea exists, it greatly enhances a case's ability to transmit virus. Control measures are implemented through the administration of hepatitis A vaccine or immune globulin (IG) to the people who had contact (see definition of contact directly below) with the case during their infectious period. Healthy persons between the ages of 12 months and up to and including 40 years of age can receive single antigen hepatitis A vaccine or IG. Hepatitis A vaccine is preferred for this age group. For persons 41 years of age or older, IG is preferred but vaccine can be used if IG cannot be obtained. IG should be used for children under the age of 12 months.

The safety of hepatitis A vaccination during pregnancy has not been determined; however, because hepatitis A vaccine is produced from inactivated hepatitis A virus, the theoretic risk to the developing fetus is expected to be low. The risk associated with vaccination should be weighed against the risk for hepatitis A in pregnant women who might be at high risk for exposure to hepatitis A.

Post exposure prophylaxis should be administered as soon as possible and within 14 days of last exposure to an infectious case. Persons who receive immune globulin and for whom hepatitis A vaccine is recommended for other reasons should receive a dose of hepatitis A vaccine to provide long term protection at the same time they receive IG. This would include persons routinely recommended to receive hepatitis A vaccine as listed below. For persons who receive vaccine, the second dose should be administered through their healthcare provider according to the licensed schedule to complete the series. Combination hepatitis A and B vaccine **is not** to be used for post exposure prophylaxis. In persons exposed more than 14 days ago, vaccine or IG treatment will not prevent the illness. Those persons should watch for symptoms of hepatitis A and practice good hygiene, including frequent hand washing with soap and water. They should see their healthcare provider and notify public health if symptoms develop.

A *contact* is defined as:

All household members; sexual contacts; persons who have shared illicit drugs with the case, food handling employees who work with the case; and anyone consuming uncooked foods or foods handled after cooking prepared by an infectious case that had diarrhea or poor hygienic practices at the time of food preparation. Other household-like contacts (e.g. baby sitter that comes in routinely).

Immune Globulin:

The following persons should not receive immune globulin:

1. Persons with known immunoglobulin A (IgA) deficiency.
2. Persons with severe thrombocytopenia or any blood coagulation disorder which would contraindicate intramuscular injections.

Caution should be used in giving IG to a patient with a history of anaphylactic reactions to immune globulins. IG is not recommended for persons who have clinical symptoms strongly indicative of hepatitis A.

Immune globulin may interfere with immunizations for measles, mumps, rubella, and chickenpox. These live attenuated vaccines should not be given for at least three (3) months after administration of IG. Also, if it is necessary to administer IG within the 2 weeks following MMR or varicella vaccine the vaccine should be repeated. The repeat dose of MMR or varicella vaccine should not be given sooner than three (3) months after IG.

Hepatitis A Vaccine

Persons routinely recommended to receive hepatitis A vaccine:

- Children at 12–23 months of age. Vaccination should be integrated into the routine childhood vaccination schedule. Children who are not vaccinated by 2 years of age can be vaccinated at subsequent visits.
- Travelers to high or intermediate risk countries.
- Men who have sex with other men.
- Persons who use illegal drugs.
- Persons who have clotting factor disorders.
- Those who work with hepatitis A-infected primates or with hepatitis A virus in a laboratory setting.
- Susceptible persons who have chronic liver disease.
- Susceptible persons who either are awaiting or have received liver transplants should be vaccinated.
- Any person one year old or older who wants protection from Hepatitis A.

C. Managing Special Situations

Child Care

If a confirmed case of hepatitis A occurs in a child care setting, parents and staff must be notified. Hepatitis A fact sheets should be provided at that time.

Hepatitis A vaccine or IG should be administered to all previously unvaccinated staff members and attendees of child care or homes if

- 1) One or more cases of hepatitis A are recognized in children or employees. In centers that do not provide care to children who wear diapers, hepatitis A vaccine or IG need be administered only to classroom contacts of the index case.
- 2) Cases are recognized in two or more households of center attendees. In centers that do not provide care to children who wear diapers, hepatitis A vaccine or IG need be administered only to classroom contacts of the index case.

When an outbreak occurs (i.e., hepatitis A cases in three or more families), hepatitis A vaccine or IG should also be considered for members of households that have children (center attendees) in diapers.

- Enforce policies about hand hygiene (with children and staff) and disinfection of objects and environmental surfaces with appropriate bleach solutions or other solutions that state they kill HAV.
- Make sure all parents and staff notify the health department if any person in their household is diagnosed with hepatitis A.

Exclusion Guidelines

People who are sick with hepatitis A can return to the program no less than two weeks after the illness started or one week after onset of jaundice.

Schools and Work Settings

Hepatitis A postexposure prophylaxis is not routinely indicated when a single case occurs in an elementary or secondary school or other work setting and the source of the infection is outside the school or work setting. Careful hygienic practices should be emphasized, including availability of hand hygiene supplies. Hepatitis A vaccine or IG should be administered to persons who have had close contact with the index case if an epidemiologic investigation indicates HAV transmission has occurred among students in a school.

Hospitals

When a person who has hepatitis A is admitted to a hospital, staff members should be using standard precautions and therefore not be exposed to hepatitis A. Routine administration of hepatitis A post-exposure prophylaxis should not be needed; instead, careful hygienic practices should be emphasized. Hepatitis A vaccine or IG should be administered to persons who have close contact with index patients if an epidemiologic investigation indicates HAV transmission has occurred among patients or between patients and staff members in a hospital.

If a hospital staff member is diagnosed with hepatitis A and is considered a food handler then the food handler guidelines must be followed.

Cases who are healthcare providers should not work until 7 days after onset of jaundice or two weeks after the onset of symptoms.

Community Residential Programs

Actions taken in response to a case of HAV in a community residential program should be handled on a case-by-case basis. Management of contacts will depend on the level of hygiene of the case and the type of facility. Roommates should be given hepatitis A vaccine or IG as soon as possible, and within 14 days of last exposure. If hepatitis A occurs in a staff member of a residential program, the case should be considered a food handler if there was an opportunity to feed, distribute medication, prepare foods or perform oral hygiene during the 2 weeks prior to symptom onset and 1 week after symptom onset. Consult with an epidemiologist at CADE by calling (800) 362-2736.

Food Handler

A food handler is any person directly preparing or handling food, including a patient care or child care provider, or homemaker.

A confirmed case of hepatitis A in a food handler is a public health emergency and requires that risk for both co-workers and the public be assessed immediately. If a food handler is a laboratory-confirmed case of hepatitis A, all other food handling employees in the facility must receive hepatitis A vaccine or IG as soon as possible, unless the contact can produce documentation of hepatitis A virus (HAV) vaccination or can show serologic immunity to HAV disease. Even after receiving hepatitis A vaccine or IG, they should wash hands correctly and protect READY-TO-EAT FOOD from contamination introduced by bare hand contact for the next 6 weeks to prevent the spread of infection. If the employee does become sick, the employee should stop working immediately and be tested for HAV IgM antibodies.

In order to determine if the public needs to be notified of possible exposure to HAV, a complete food handling history of the case for the 2 weeks before and one week after symptom onset needs to be done. This history should include consistency of correct handwashing procedure, presence of diarrhea, dates worked, job duties, foods prepared, and whether gloves or other barrier protection were used by the food handler. See the Epi Manual's Hepatitis A section for the food handler assessment worksheet. Please call CADE at (800) 362-2736 to help determine the risk to the general public and to arrange shipment of prophylactic hepatitis A vaccine or IG.

Cases who are food handlers should not work until 7 days after onset of jaundice or two weeks after the onset of symptoms.

Refer to Acute Hepatitis A Management in the Food Handler flowchart.

Hepatitis A vaccine or IG administration to patrons is usually not recommended, but can be considered if:

- During the time when the food handler was likely to be infectious they had diarrhea or poor hygienic practices and directly handled foods served uncooked or handled foods after cooking, *and*
- Patrons can be identified and treated within 2 weeks after the exposure.

- In settings where repeated exposures to HAV might have occurred (*e.g.*, institutional cafeterias), stronger consideration for more widespread hepatitis A vaccine IG use may be warranted.

Reported Incidence Is Higher than Usual/Outbreak Suspected

If the number of reported cases in a city/town is higher than usual, or if an outbreak is suspected, investigate clustered cases in the area or institution to determine the source of infection and mode of transmission. A common vehicle (such as food or association with a child care center) should be sought and applicable preventive or control measures should be instituted. Control of person-to-person transmission requires special emphasis on personal cleanliness and sanitary disposal of feces. Consult with the epidemiologist at CADE by calling (800) 362-2736. CADE can help determine a course of action to prevent further cases and can perform surveillance for cases that may cross several county lines and therefore be difficult to identify at a local level.

D. Preventive Measures

Personal Preventive Measures/Education

Individuals can avoid exposure to the virus by taking the following measures.

- Wash hands thoroughly with soap and water, especially before handling or eating food, after toilet use, and after changing diapers.
- In child care or residential programs, dispose of feces in a sanitary manner.
- Avoid sexual practices that may permit fecal-oral transmission. Latex barrier protection should be emphasized as a way to prevent the spread of HAV to a case's sexual partners as well as being a way to prevent exposure to and transmission of other pathogens.
- Consider vaccination of those at high-risk of contracting hepatitis A. Iowa residents who should be vaccinated include the following:
 - Persons (\geq 12 months of age) traveling to or working in countries with high or intermediate rates of hepatitis A, such as Central or South America, the Caribbean, Mexico, Asia (except Japan), Africa, and southern or eastern Europe. The second dose should be given 6 months or later after the first.
 - Men who have sex with men.
 - Illegal drug users, whether injecting or not.
 - Persons with chronic liver disease (not just infection), including those who are awaiting or have received liver transplants.
 - Persons who receive clotting factor concentrates.
 - Persons who have occupational risk for infection; specifically, those who work with HAV-infected primates or with HAV in a research laboratory setting. Sewage workers do not need to be vaccinated.

International Travel

Travelers to areas where hepatitis A is endemic should receive hepatitis A vaccine before travel. The first dose of hepatitis A vaccine should be administered as soon as travel is considered. One dose of single-antigen hepatitis A vaccine administered at any time before departure may provide adequate protection for most healthy individuals. For optimal protection, older adults, immunocompromised persons, and persons with chronic liver disease or other chronic medical conditions who are traveling to an area where risk of transmission is high less than two weeks after the initial dose, may also be administered IG, but at a different anatomic injection site. Completion of the vaccine series according to the licensed schedule is necessary for long-term protection. However, contraindications to the vaccine may preclude individuals from receiving it. If an individual is allergic to a component of the vaccine or is <12 months old (vaccine is not licensed for this age group), that individual should not receive the vaccine. In addition, travelers should pay attention to what they eat and drink. This step is extremely important because the vaccine is not 100% effective and immunity conferred from IG wears off over time (3-6 months). Taking precautions such as those listed below will help prevent other illnesses as well, including travelers' diarrhea, cholera, dysentery, and typhoid fever.

Recommendations to travelers include the following.

- "Boil it, cook it, peel it, or forget it."
- Drink only bottled or boiled water, keeping in mind that bottled carbonated water is safer than non-carbonated water.
- Ask for drinks without ice unless the ice is made from bottled or boiled water.
- Avoid Popsicles and flavored ices that may have been made with contaminated water.
- Eat foods that have been thoroughly cooked and are still hot and steaming.
- Avoid raw vegetables and fruits that cannot be peeled. Vegetables like lettuce are easily contaminated and are very hard to wash well.
- Peel your own raw fruits or vegetables and do not eat the peelings.
- Avoid foods and beverages from street vendors.

For more information regarding international travel and hepatitis A, contact the CDC's Traveler's Health Office at (877) 394-8747 or through the Internet at <http://www.cdc.gov/travel> .

4) ADDITIONAL INFORMATION

The Council of State and Territorial Epidemiologists (CSTE) surveillance case definitions for Hepatitis A can be found at: www.cdc.gov/osels/ph_surveillance/nndss/phs/infdis.htm#top

CSTE case definitions should not affect the investigation or reporting of a case that fulfills the criteria in this chapter. (CSTE case definitions are used by the state health department and the CDC to maintain uniform standards for national reporting.)

REFERENCES

American Academy of Pediatrics. *2006 Red Book: Report of the Committee on Infectious Diseases, 27th Edition*. Illinois, American Academy of Pediatrics, 2006.

CDC. *2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Healthcare Settings, June 2007*

CDC. Prevention of Hepatitis A through Active or Passive Immunization. *MMWR*. May 19, 2006 / 55(RR07);1-23.

CDC. Update: Prevention of Hepatitis A After Exposure to Hepatitis A Virus and in International Travelers. Updated Recommendations of the Advisory Committee on Immunization Practices (ACIP), *MMWR*, October 19, 2007 / 56(41);1080-1084

CDC Website. Viral Hepatitis A. Available at www.cdc.gov/ncidod/diseases/hepatitis/a/index.htm.

Heymann, D.L., ed., *Control of Communicable Diseases Manual, 20th Edition*. Washington, DC, American Public Health Association, 2015.

Food and Drug Administration, Food Code 2013:

www.fda.gov/Food/GuidanceRegulation/RetailFoodProtection/FoodCode/ucm374275.htm